

VOLUME 50  
No. 1

WHOLE NO. 221  
1938

# Psychological Monographs

EDITED BY

JOHN F. DASHIELL  
UNIVERSITY OF NORTH CAROLINA

---

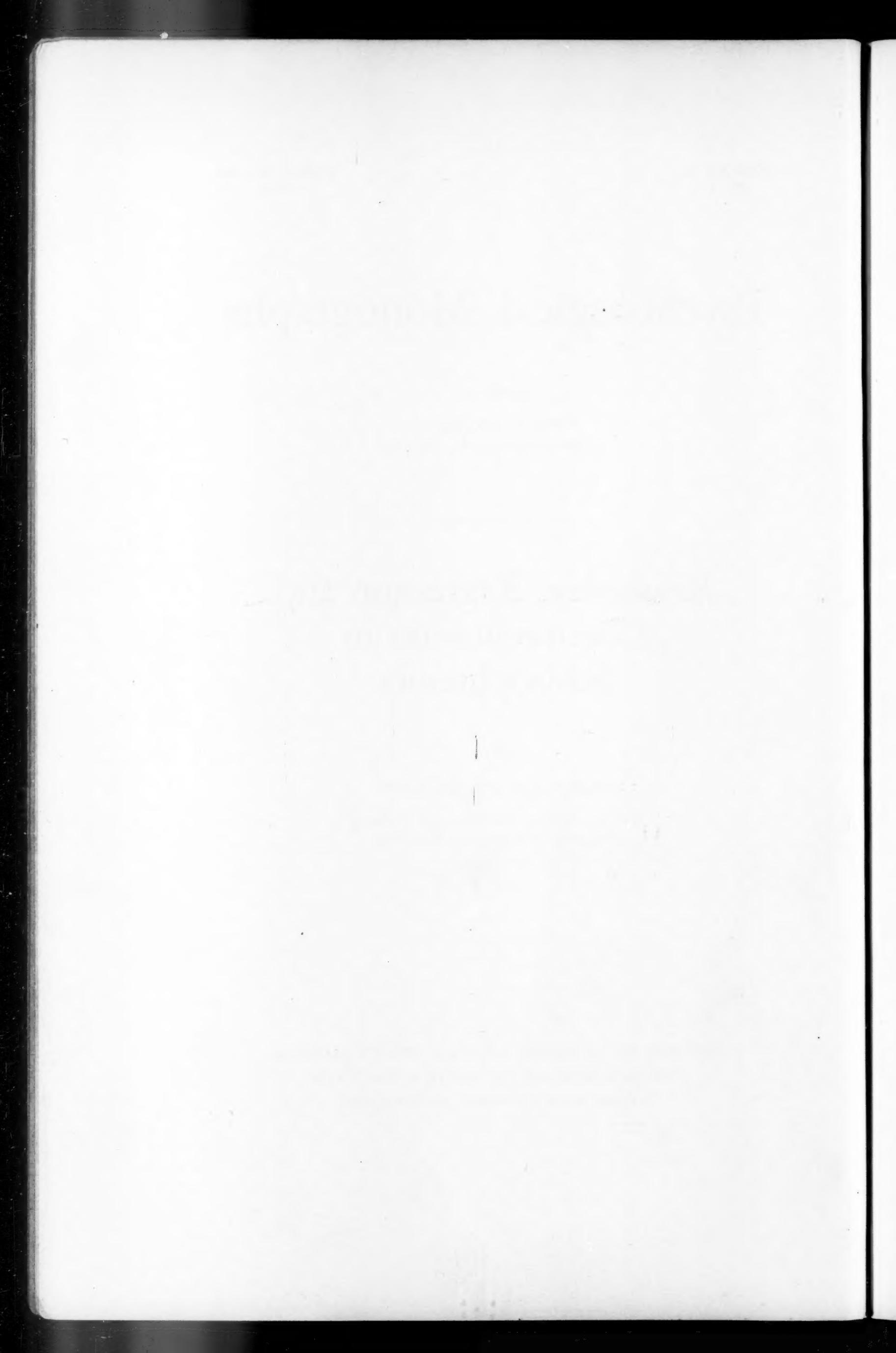
## Reasoning, Regression and Communication in Schizophrenics

By

NORMAN CAMERON  
HENRY PHIPPS PSYCHIATRIC CLINIC,  
THE JOHNS HOPKINS HOSPITAL

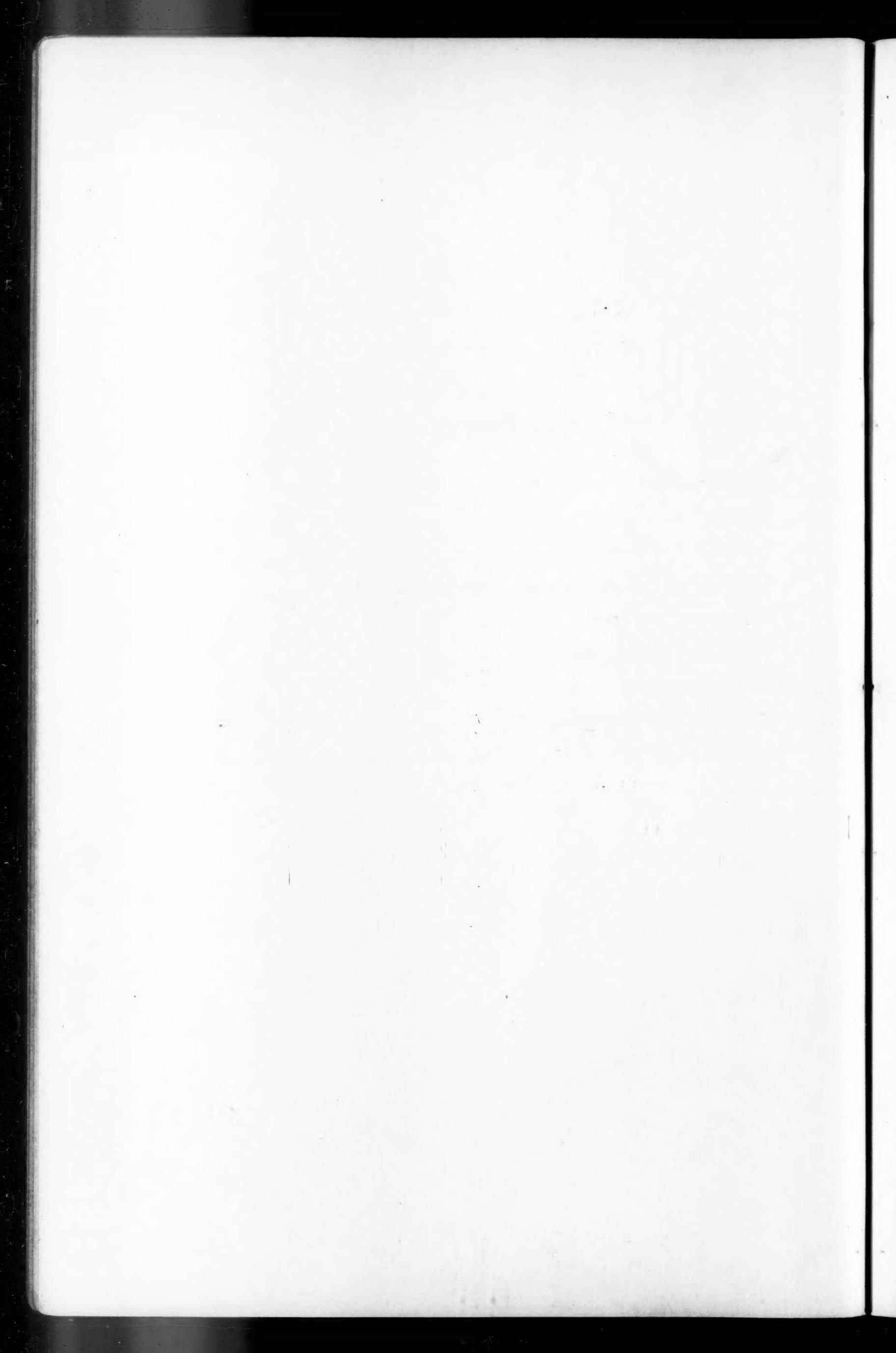
---

PUBLISHED FOR THE AMERICAN PSYCHOLOGICAL ASSOCIATION BY  
THE PSYCHOLOGICAL REVIEW COMPANY  
THE OHIO STATE UNIVERSITY, COLUMBUS, OHIO



## CONTENTS

	PAGE
INTRODUCTION.....	1
METHOD.....	6
CAUSAL RELATIONSHIP .....	9
RELATIONSHIP OF DISCORDANCE (ANTITHESIS).....	12
ASYNDETIC THINKING .....	14
METONYMIC DISTORTION .....	20
INTERPENETRATION.....	24
SUMMARY AND DISCUSSION.....	27
LITERATURE CITED .....	33



## INTRODUCTION \*

In recent years the study of the psychology of reasoning has been enriched by contributions from the fields of the genetic and the abnormal. The comparison has frequently been made between the thinking of children and of psychopathic persons, particularly those suffering from schizophrenic illnesses in whom striking disorders in the form and content of thought occur as, for instance, in the papers of Piaget (14) and of Wildermuth (27). The purpose of the investigation reported in this paper was two-fold: (1) To study reasoning, under controlled conditions, as it appears in adults whose thinking has undergone modifications in a rather common form of disorganization; and (2) by analysis of the form and structure of schizophrenic reasoning and the relation of its content to the stream of personal preoccupations, to attempt to introduce greater clarity and definition into conceptions of this notoriously vague type of human thinking. Although our material is derived for the most part from a study of abnormal persons, the results by no means stand outside the realm of the normal psychology of reasoning. We shall have special occasion to draw comparisons with the results obtained by others in their study of children; but there are definite points of contact also with the normal adult. The personal preoccupations of normal adults very commonly intrude themselves to a certain extent into reasoning even in relation to relatively neutral topics. Moreover one may observe at times a certain degree of disorganization, not altogether unlike that which we shall see in this study, occurring in otherwise normal persons under conditions of distraction, in fatigue (C. Schneider, 20), under emotional stress and in toxic and infectious states. Some of the characteristics to be described in this paper are also found among quite normal persons and under normal conditions, but to a lesser degree. The occurrence of these characteristics in a more exaggerated form in our material may bring them into a bolder relief.

\* We are indebted to the Supreme Council, 33° Scottish Rite Masons of the Northern Jurisdiction, U. S. A., for the financial help granted for our research work in schizophrenia.

and perhaps aid in their further study among normal subjects. One of the most outstanding characteristics of schizophrenic thinking is its disjointed and apparently incoherent structure for which the term "scattering" has been commonly employed. As Sullivan (24) has remarked, the difficulty in communicating with schizophrenics has been in some respects an important obstacle in the way of the physician's maintaining a general interest in them; but at the same time this very characteristic has stood as a provocative challenge that has been often and variously answered. Our task was to induce simple reasoning in persons known to exhibit this type of incoherence in their stream of talk, and then to subject the product thus obtained to a functional analysis on the basis of the form it assumes, its relevance to the problem, its efficacy as communication, and its relation to the habitual language responses and individual preoccupations of the person. The question of communicability was regarded as of prime importance. It has the advantage of being susceptible of objective evaluation; it is closely tied up with the more general problem of the asocial characteristics of schizophrenics; and it has been the subject of rather extensive study in connection with normal children, particularly by Luquet, Piaget, Huang, Abel, and Hazlitt.

Piaget (14) has made some interesting comparisons between normal adult thinking, that of the child, and that of the schizophrenic in an early article where he has drawn the general conclusion that the child's thinking lies midway between autistic thinking and the logical thought of the adult. In a later work (16) he sums up his studies on communication in the child. Beginning with the fundamental questions, "Why does the child talk?", "What are the functions of language?", and "Under what circumstances does it occur?", he goes on to consider what purpose language serves for the child and to what extent it fulfills its purpose. On the basis of his results he divides language functionally into asocial and social, that is, into incommunicable and communicable. (As asocial forms he recognizes in ascending order of complexity (1) *repetition*, a remnant of early prattle having little or no relation to present activity; (2) *simple mono-*

*logue*, in which talk is a mere accompaniment or a part of general activity, the child talking to himself about what he is doing very much as many adults do while working at something; and (3) *collective monologue*, bearing in it the germs of rudimentary conversation but having as yet no function of genuine interchange.) In this last form the child apparently feels no need of being listened to, nor yet of being understood, and indeed shows no expectation of either; the presence of others seems to serve merely as a stimulus for talking. Each child in a group talks only about himself, sticks to his own point of view, and makes no effort whatsoever to understand the others. Numerous interesting examples are given by way of illustration. These three forms taken together Piaget calls *asocial* because they are not genuinely communicative. Repetition as prattle is obviously asocial; the monologue is addressed to no one but the speaker; the collective monologue, while apparently addressed to others, involves no interchange of information and has for all practical purposes no effect upon others excepting to act as an almost undifferentiated general mutual stimulation. (The remaining functional classifications of language he groups as social in that they represent true interchange, wherein information and attitudes are conveyed, and common activities are talked about,—all with the obvious intention on the part of each speaker of being heard and of being understood.)

From further studies of conversation, and of attempts at demonstration and exposition, Piaget drew interesting conclusions regarding communication which are of importance in connection with our own study. The young child, Piaget finds, takes it for granted that he will be understood and is astonished when, after giving a hopelessly inadequate rendition of a story, for example, he discovers that his hearer has not grasped the relationships that he himself certainly felt were implied. Moreover there is a curious lack in the children's talk of that order and sequence one is accustomed to find in adult narrative or exposition; and there is an outstanding absence of causal links. In the explanations he gives, the child evidently "feels" that certain things belong together; but he doesn't make this connec-

tion in any way explicit. He simply juxtaposes related material in whatever order it happens to occur, instead of arranging it in a natural or a logical order and connecting it by explicit causal links. He is apparently unable to place himself in the position of others, to imagine their point of view, and so to realize their needs and his own gaps. The end-result is that in place of well-integrated concepts that can be expressed in a conventional form and thus used as common currency for communication between individuals, there is a loose conglomerate personally quite satisfying to the as yet asocial child, but failing in what should be its essential characteristic,—communicability.

In his work on judgment and reasoning in the child Piaget (15) has attacked the problems of causal reasoning, the use of connectives and the ability to handle inclusion and exception on the part of children. It was his study of the causal relationships and the concept of exception that indicated the method for our own study. The interpretations, however, have a different emphasis and focus as will be outlined in connection with our own results and their discussion.

Huang (8), in an extensive series of experiments on the explanations of strange phenomena, found the same tendency of children to juxtapose statements without their apparently recognizing the need to reconcile or integrate them. The older children were able to supply intermediary links when specifically questioned, but the younger ones were utterly incapable of it even when asked. Among young college women Huang found that when adequate complex principles were not available in their past experiences, these adults often fell back upon whatever simpler concepts they might happen to have; and sometimes they, also, were unable to supply adequate explicit connections afterwards. These results seem to favor the view that the difference between child and adult in this respect is one of degree rather than that of the appearance of an abrupt qualitative change during development. Definite examples of juxtaposition did appear in Abel's experiments (1) in which adults were obliged to render passages from the *Scientific Monthly* to each other, but they were very rare. Hazlitt (7), in a study of generalization in children,

attributes much to the rôle of prior education and training in the handling of concepts. Other investigators also emphasize the rôle of accumulated experience in adult thinking, and some even go so far as to ascribe differences in the responses of mature and immature persons mainly to differences in understanding questions and to experience in knowing how to look for the required answers.

In our own study we were dealing with persons of mature years who had already been exposed to the usual experiences associated with ordinary living. At some phase of their development, long after childhood had been passed through, an illness appeared bringing with it some degree of disorganization. Moreover, in one of our cases the same person has been studied by the same methods at the height of his illness and again during a period of decided remission or improvement, affording an unusually fortunate opportunity for a comparison that possesses more than the average degree of validity.

Vigotsky (25), apparently stimulated by Piaget's work on children, has made a study of the formation and disintegration of concepts in schizophrenia. He feels, with Kretschmer, that "the development of concepts, like the appearance of other higher psychologic functions, is accomplished by the formation of new layers over the old ones, with the preservation of the older layer of thought in a subordinate function." Storch (22), after referring to a similar view of layer-formation held by Reiss (18), speaks of "the decomposition of schizophrenic thought into complexes" which "corresponds to a regression to the stage of development where the activities are limited to the sphere of affect and instinct." Von Domarus (4) has built up hypotheses relating schizophrenic disturbances to a hierarchy of "demonic," "paralogic" and logical thinking and expressed an "Anlagequotient" in terms of their relative proportions. Implicit in these and other widely held views concerning schizophrenic regression is the assumption that in developing disorganization of thought the patient goes through what has often been termed colloquially a "peeling-off" process, in which the outer layers of racial or of individual maturity are lost and the primitive or

the child-like nucleus laid bare.) Bleuler (2) questions our right "to assume that primitive peoples were in themselves less able to think sharply than we." White (26) has also suggested caution in connection with the same theories by remarking, "I shall not further discuss this analogy except to say that the end-result in our [normal] thought and speech, whatever it may be, contains phylogenetic and ontogenetic factors inextricably mixed," to which we would add that the same might be said of the process of schizophrenic regression as it appears in reasoning.

In this paper we are primarily concerned not so much with the formation of concepts as with their use. We shall see in our own results that, at least functionally considered, increasing disorganization does not result in the schizophrenic adult's retracing in the reverse direction those phases which characterized the development of his reasoning in childhood. There is little evidence to be gathered through a study of causal reasoning and antithetical relations in schizophrenia to support the assumption that one is witnessing a "peeling"; the disorganization seems to be really a process of disintegration rather than one of delamination.

#### METHOD

Our chief interest lay in the psychology of reasoning. In order to induce simple reasoning in our subjects we confronted them with a series of previously prepared uncompleted causal sentences, after the manner of Piaget (15); and these were sometimes supplemented by direct questions or followed up by further interrogation and requests for explanations. This study was extended further to gather material on the notion of exception or discordance and the concept of relationship. The material was obtained under as nearly uniform conditions as possible. Of the twenty-five cases studied, all but one were worked with alone in an office or in a small reception room with the door closed. In this way extraneous noises and distracting occurrences were reduced to a minimum. Since none of the work was delegated to others it was possible to maintain uniformity of technique throughout, a factor of considerable importance in any human psychological procedure. The technique necessary for such dis-

cussion and coöperative working with schizophrenic persons in a hospital environment had been acquired by the experimenter through responsible daily contact with psychiatric patients over a number of years.

It did not prove especially difficult with most of the subjects to establish a satisfactory informal working rapport that focussed attention upon the task rather than upon the experimenter. With very few exceptions the patients were quite interested in the procedure and their responses and solutions were much more often carefully considered than merely off-hand. Sometimes hostility prevailed, particularly in two of the cases; but hostility is not always as uncompromising and asocial as it seems, since in order to be hostile one must as a rule at least take the other person into account. In one case an openly threatening attitude was partly responsible for bringing out, in a different form, illustrations of the interpenetration of personal- and problem-themes that were just as useful and informative as were those of a very friendly and coöperative patient.

The responses and remarks of the subjects, together with those of the experimenter, were recorded verbatim on the spot in a form of "speedwriting" shorthand. The material thus obtained was examined for its yield and the results grouped for comparison; analysis of this material and its presentation as a basis for discussion will be taken up later under the separate divisions. The case records and the impressions of other physicians and of nurses were available to the writer as sources of auxiliary information. Only those patients who were quite unmistakably schizophrenic, who showed definite scattering at the time of the investigation, and who were able to coöperate, were included in the results. The study, originally suggested by Dr. Adolf Meyer, was carried out at the Henry Phipps Psychiatric Clinic and at the Spring Grove State Hospital; the writer wishes to acknowledge also the helpful coöperation of Dr. S. Weltmer, Superintendent, and of Dr. Herbert Harms, Clinical Director, of the latter institution.

The results will be presented in the following order:

1. The study of *causal relationship*, which is taken up first, makes possible the comparison in point of maturity between the reasoning of our subjects and that of normal children.

2. The next subject, a study of the *relationship of discordance* or *antithesis*, permits an interesting further comparison with the results in the preceding section on causal relationship and, as will be seen, throws further light upon the question of regression. For Piaget has been able to show that there is a distinct difference in the ages at which the different forms of causal reasoning preponderate and at which antithesis or discordance is satisfactorily appreciated, and from the variation in their genetic development to distinguish levels of maturity in reasoning.

3. Under the term *asyndetic thinking* we have presented a genetically important phenomenon. This is a form of deficiency in integration at the level of language behavior in which elements are merely juxtaposed, placed next to each other without adequate linkage between them. This form is also socially significant because the product is defective from the standpoint of communication.

4. The peculiar but distinctive vagueness that sets up a nebulous barrier around the schizophrenic receives a certain degree of definition in the analysis of the rôle of *metonymic distortion*. This is seen to be a rather characteristic displacement of a precise term by an approximation through the partial disintegration of concepts. The individual elements making up the clusters that replace concepts acquire an apparent equivalence for the patient which makes it first difficult and then impossible for that elimination to take place which is the very essence of choice.

5. Finally, the occurrence of an *interpenetration of themes* is exemplified and briefly discussed. By our method of setting a specific problem it is possible to demonstrate the manner in which the theme dominated by the problem presented is received into that of the prevailing preoccupations of the patient.

## CAUSAL RELATIONSHIP

In his study of the expression of causal relationships in children, Piaget found it necessary to recognize a three-fold division based upon the different functional uses of the term *because* in their reasoning. He presents results (15) from which he derives the thesis that as the child matures his reasoning undergoes a phasic change, in part expressed by the development in his comprehension and utilization of these genetically different forms. (a) The type of logical reasoning which he regarded as most mature is that indicating a relationship of (*cause and effect*) (e.g., "A man fell down in the road because he stumbled"). Piaget found this to be of very infrequent occurrence among children younger than seven years. (b) A somewhat less mature form he designates as that of (*logical justification*) in which the appeal is made by the subject from one principle to another principle (e.g., "That animal is not dead because it is moving"). (c) His third type he calls (*psychological motivation*) (e.g., "A boy threw a stone at me because he wanted to hit me"). In his results he finds this to be the predominant form in young children appearing where an adult would be expected to supply one of the other two types.

Piaget attributes the prevalence of the relation of psychological motivation that he found to the *egocentricity* of the young child, whose dominant standard at this period seems to be that of his own feeling of satisfaction with the result. It is only later on, through the child's coming into conflict with the reactions and opinions of others, that he is forced to recognize the *need* for convincing others of the *validity* of his own conclusions, a process which also favors development toward the further objectivation of events as a part of his reasoning.

Singer (21) stresses a fundamental point in his paper on regression in schizophrenics when he says, "These people use childish tools but do they use them in a childish way?" Our subjects reason in a peculiar way but is this an approximation

to the child's usage? That is the core of our problem. It will be approached from several directions, but the first and the simplest comparison is that between the success of the schizophrenic in handling these types of causality and the data on hand concerning the success of the child. It goes without saying that the older less mature forms of reasoning persist along with the development of the newer; but their relative prevalence diminishes with growing maturity and its attendant socialization. The following table gives a rough comparison of the frequency of the occurrence of each of these three forms in the spontaneous reasoning of six-year-old children, and in the induced reasoning of our schizophrenic adults who exhibited scattering.

TABLE 1  
RELATIVE OCCURRENCE OF TYPES OF CAUSAL RELATIONSHIP IN YOUNG CHILDREN AND IN ADULT SCHIZOPHRENICS

Type of Causal Relationship	Percentage in Six Year Old Children	Percentage in Adult Schizophrenics
Cause-and-effect .....	7.5	45
Logical justification .....	9.0	23
Motivation .....	83.5	32

The striking predominance in young children's logic of the expressions of *motivation* we do not find matched by anything comparable in our schizophrenic material where motivation accounts for only about one-third of the causal relations that were unambiguously expressed. The *cause-and-effect* relationship, on the other hand, accounts for nearly one-half of the schizophrenic responses but for less than one-thirteenth of the children's. Evidently these two forms are fundamentally quite different.

A still more pertinent question is that of the relationship between degree of disorganization of the language function and the relative proportion of the types of causal reasoning within our own group of subjects. This was met by arranging the cases in order in accordance with the severity of their disorganization, as expressed in the degree of scattering shown by each, and then forming sub-groups to include the mild (7 cases), the moderate

(10 cases), and the severe (8 cases) degrees of disorganization. The evaluation of each of the 375 items involved was made separately by two different persons familiar with Piaget's work and trained in psychopathology. The percentages given in Table 2 indicate the proportion of all the unambiguously expressed causal relationships assigned to each of the three types of reasoning.

TABLE 2  
RELATIVE OCCURRENCE OF TYPES OF CAUSAL RELATIONSHIP IN DIFFERENT DEGREES OF SCHIZOPHRENIC DISORGANIZATION

Type of Causal Relationship	Percentages of Total Causal Relationship Expressed		
	In Cases With Mild Disorganization	In Cases With Moderate Disorganization	In Cases With Severe Disorganization
Cause-and-effect . . . . .	39	43	58
Logical justification . . . . .	32	25	10
Motivation . . . . .	29	32	32

It is quite evident that there is no decrease in the capacity of our subjects to handle *cause-and-effect* relations effectively as one passes from the mild to the severe degrees of disorganization provided, of course, they will attempt the problem at all, which was our chief basis of selection. *Motivation* likewise does not show a decrease. The capacity for *logical justification*, however, suffers relatively a marked drop in the severally disorganized group. The conclusion one can draw from this is that in our own material the form of causal relationship which is the last of the three types to develop genetically, *cause-and-effect*, shows no apparent relation to the degree of disorganization of thinking.

Finally we shall make a comparison sentence for sentence with data presented by Piaget to show the definite superiority his children up to nine years show in their ability to handle motivation. His data are based upon a study of 180 children. There are two uncompleted sentences used by Piaget, one demanding a cause-and-effect relationship (*i.e.*, "That man fell off his bicycle because . . ."), and another calling for motivation (*i.e.*, "I shan't go to school today because . . ."). Among our fifteen uncompleted sentences we have the equivalents of each, in cause-and-effect (*i.e.*, "A man fell down in the road because . . .").

and in motivation ("A boy threw a stone at me because . . ."). The comparative results are given in Table 3.

TABLE 3  
RELATIVE SUCCESS IN CAUSE-AND-EFFECT AND IN MOTIVATION SHOWN BY CHILDREN AND BY SCHIZOPHRENICS

Type of Causal Relationship	Children		Schizophrenics
	Age 7 Years	Age 8-9 Years	
Cause-and-effect.....	70%	77%	52%
Motivation.....	85%	95%	44%

The essential contrast in these results lies in the relatively poorer showing the schizophrenic patients made in the genetically immature type of *motivation*. In no sentence of this type did the figures rise more than four per cent above those for cause-and-effect. When we again inquire into the performance in the severely disorganized patients, we find in this group only a single satisfactory example of induced reasoning by motivation; yet the same persons succeeded in completing satisfactorily eleven examples showing the cause-and-effect type of relationship. (Thus one fails to find in this part of the study any confirmatory evidence for the simple form of regression implied in a delamination that would remove, layer by layer, the more mature forms of reasoning as disorganization proceeds. Even in our severely disorganized group there is nothing to suggest a puerile nucleus laid bare.)

#### RELATIONSHIP OF DISCORDANCE

In the preceding section we discussed the relative expression of the three types of causal relationship by our subjects and compared these results with those for young children. It was evident that our schizophrenics did not show a greater tendency for the less mature form, the relation of motivation, to persist as compared with the more mature cause-and-effect relationship. We shall now present some data of a different kind that serves to support these earlier conclusions.

The use of antithetical terms expressing *discordance* seems to belong to a still more mature phase in the development of reasoning than does the use of any of the causal relationships already

considered. Whereas children begin the correct use of *because* in one sense or another from a very early age, the use of discordance appears at a much later period. Our specific interest here is to see whether in schizophrenic disorganization this later acquisition suffers more than the earlier appearing causal relationship. To this end we confronted our patients with a number of uncompleted sentences ending in *although* and *even though*. These involve the principle of exception which, for young children, proves a very difficult task and one which they are evidently able to handle increasingly well as they mature. A comparison, in our results, between the ability to handle causal relationships with the ability of the same persons to handle discordance or exception brought out an interesting contrast. If, as in the preceding section, the patients are arranged in order according to the degree of disorganization they show, a consistent difference appears between the mildly scattered, the moderately scattered and the severely scattered. In Table 4 are given the percentages of causal and discordant relationships that were correctly expressed in the three groups.

TABLE 4  
RELATIVE OCCURRENCE OF CAUSAL RELATIONSHIPS AND OF DISCORDANCE IN  
DIFFERENT DEGREES OF SCHIZOPHRENIC DISORGANIZATION

Degree of Disorganization	Percentage Expressed Correctly	
	"Because"	"Although"
Mild . . . . .	57	38
Moderate . . . . .	41	32
Severe . . . . .	11	35

Here we see *discordance* or *exception*, which Piaget found developing late in children's reasoning, showing in our schizophrenic patients a negligible reduction as the disorganization increases; while the *causal relationships* are definitely reduced in the moderately disorganized group and drop off abruptly in the severely disorganized. Thus we find the severely disorganized group doing more than three times as well with the more mature logical relation of discordance than with that of causal relationship.

If the assumption is correct that discordance really represents a more mature phase in the development of reasoning, then our results point to an important fact. Our schizophrenics show relatively a definitely superior preservation of their ability to deal with the discordant over that of the causal relationships. Thus we have another indication that in the disorganization of their thought processes they do not retrace the steps of development which children pass through in the growth of reason. More mature forms of reasoning are better preserved than the less mature as one passes from mild toward greater disorganization of thinking.

Up to this point we have been focussing attention upon whatever seemed definite and precise in the reasoning of our schizophrenics. We have now to direct attention to factors involved in the characteristic vagueness, the prevailing lack of precision and of unity which make schizophrenic logic so difficult to follow. This is a study of the geography of schizophrenic reasoning. From the analyses of our material we were able to pick out three factors distinct enough to justify separate discussion. These are: (1) the appearance of loose clusters of terms in place of organically integrated concepts; (2) the use of terms or phrases that approximate the meaning, striking somewhere on the periphery of the target instead of at the bull's eye; and (3) the concomitant appearance of coördinate themes interweaving with each other and through mutual interference producing what at first glance looks like a mere jumble of words.

#### ASYNDEMIC THINKING

The appearance of loose clusters of terms instead of the more organically integrated concepts represents in fact a special case of the general disorder of fusion so commonly encountered in schizophrenia. The most outstanding characteristic is a striking paucity of genuinely causal links which, if present, would func-

tion in binding the whole together into an integrated concept. The elements of such a loose cluster, although quite evidently felt by the subject to be related, are not explicitly bound together. For this type of logical structure the term *asyndetic* has been adopted. Asyndesis is something more than the simple "juxtaposition" of Luquet (10) because, as we shall see in our examples, the terms thrown together are actually related to one another. It is something less than Renan's "syncretism" as presented by Piaget (16) in which a special form of assimilation to global schemas in child reasoning is assumed, for which there is no convincing evidence in our material. Asyndetic thinking, nevertheless, is a form that is not at all uncommon among the juxtapositions of children, where it seems to represent a prelogical phase in the development of reasoning. That in our cases it is in some way the outcome of schizophrenic disorganization appears especially clearly in a case from which we shall present data later, showing its presence during the height of the illness and its absence after partial recovery.

The following examples of asyndesis taken from our own material illustrate at once the relevancy of the elements and their lack of effective integration.

Case 9 says the wind blows "because it's time to blow." (What makes it blow?) "The air." (The air?) "The sky." (How does the sky make it blow?) "Because it's high in the air."

The reference to "time" is the result of perseveration from a previous answer regarding sunrise and can be ignored. For the rest, we find an agglomeration of words loosely connected with wind in general,—*wind, blow, air, sky, high*. These are not just any words appearing at random, but terms that are related to the general feeling one might have about wind; and the patient evidently feels that somehow these elements belong together. At the same time there is no genuine causal connection indicated, even in the last clause where the term "because" is spontaneously used. It is precisely this failure to bind together explicitly into an integrated concept terms felt as belonging together that con-

stitutes the important feature of this form of reasoning. Here is another example in answer to the same problem:

Case 16 says the wind blows "due to velocity." (Why does the wind blow?) "Due to loss of air, evaporation of water." (What gives it the velocity?) "The contact of trees, of air in the trees."

Again the result, however inadequately put together, is not a random product. The phenomena appealed to are those commonly experienced directly or indirectly in connection with wind,—*velocity, loss of air, evaporation, contact of trees, air in the trees*. The form is not unlike that found among children; but the vague reference to other atmospheric changes bears the stamp of the wider experience that obviously belongs to a more mature phase of life. A third example is somewhat different from the preceding ones:

Case 17 asserts that the wind blows "because it howls." (But why does it howl?) "Lack of coöperation with the rain and sun." (And why does that make it howl?) "I don't know."

The loose relation expressed here in the initial "reason" is followed by a statement involving other natural events,—*wind, howl, rain, sun*. Animism may possibly be implicit in the "lack of coöperation" referred to but it is difficult to say. The final phrase expresses not indifference but a genuine inability to account logically for a relation which is only felt. The whole response remains asyndetic because the patient is ordinarily no longer able to exercise the functions of selection, restriction, and orderly arrangement necessary in the process of logical thinking. The result is a conglomerate instead of an integrate.

Sometimes the patients expressed more openly this apparently quite common feeling that somehow certain things seemed to belong together; and at the same time they showed clearly their inability to select and to eliminate in the interest of deriving such a clean-cut precise result. Case 23 says his hair is fair "*because of something else; because it's on my head; it came from my mother.*" These statements, given in quick succession, represent a hit-or-miss recital of notions vaguely connected with what he knows about his hair. In the phrase "because of something

"else" he expresses the feeling of a belonging together without being able, however, to supply satisfactory content. Case 5 has brown hair. (Why?) "I don't know. It has something to do with lights." Case 15 says a boy threw a stone at him "*because stones, or jealous, or something*"; he seemed entirely satisfied with his reply. Case 22 says of the wind's blowing, "*Something about the clouds move it.*" (How do they do that?) "They move all around and that's why." The self-satisfaction was evident in this person's manner as well as in her phraseology, an attitude towards very imperfect productions which when present is quite important.

It is impossible in these answers to miss the relevance, a certain restriction to the problem and even some degree of clarity in expression, with at the same time an obvious want of direction and of an effective final pulling together of the elements into a well-integrated whole. These characteristics appear over and over again. They are not so clearly expressed in the following examples but these are included to indicate the commonness and variety of asyndesis in the schizophrenic material.

Case 23 says the sun comes up in the morning "because it's a gas"; Case 22 "because it's windy and the sun goes down at night"; Case 15 responds, "Lazy or something,—laziness"; and Case 19 says simply "Sun and light and heat." The wind blows, according to Case 18, "because we want air." (What makes it blow?) "You wouldn't say the vapor, would you?" Case 10 says "the summer." (What makes it blow?) "The coolness." Case 15 says a fish can live in the water "because they breathe under air, water or something"; Case 20 remarks "his length and the way he breathes and his gills," illustrating the lack of a sense of causality in her structure and by the use of "and" as a connective. Case 4 (male) reasons "I have fair hair because I brush it."

What can we conclude from these results? First of all, our material shows surprisingly little real irrelevance. It is evident that even when dealing with hypothetical and very abstract matters in problems imposed from without, our schizophrenic patients show for the most part a prevailing tendency to stick to the subject. While their attempts do not satisfactorily dispose of the problem, their content hovers around it. The answers are by no means sheer nonsense as may at first glance have appeared to be the case. The relatedness of the material is, however, often

very distant, the restriction to the problem is loose and too inclusive, and the clarity referred to above does not imply precision. In short we find the schizophrenic offering, in place of an integrated functional whole, something that is a collection of fragments. In asyndetic reasoning something has been lost,—the capacity for organization.

What is this functional disturbance in reasoning and to what may it be ascribed? We have said that asyndesis seems to be a part of that general disorder of fusion characteristic of schizophrenic activity. In our own material we have found an inability to bind together explicitly the terms that are felt to be related; and with this inability goes a defect in selection and elimination. Competing terms cannot be completely discarded, there is a spurious equivalence given to several terms in a given cluster, and the product remains a more or less unorganized conglomerate. Fusion in our sense implies antecedent extension. Schizophrenic reasoning permits in many instances the co-existence, without fusion or elimination, of elements that are even opposed, provided that in some way they seem related. Thus with shifting emphases contradictions appear that are akin to ambivalence. Fusion of these elements, with explicit causal linkages, would inevitably call forth a language structure expressing definite and relatively exclusive relationships without contradiction and without ambivalence. There seems to be in our material a fundamental disorder of concept-formation, in which the function may be considered either as arrested at an intermediate stage before it can be completed, or as reduced through disintegration to a simpler level of prelogical reasoning.

The last assumption raises the important question of reversibility. Is there any evidence that disorganization of thinking leading to the unmistakable appearance of asyndesis can be followed by reorganization and the return of ordinary concept-formation? This is a fundamental point because on it also hinges the decision as to whether or not this asyndetic disorganization can be correlated with schizophrenic developments. We have by way of evidence a comparison between the performance

of the same patient during a severe phase of his illness and later after partial recovery.

## CASE 23

DURING HEIGHT OF ILLNESS	AFTER PARTIAL RECOVERY
My hair is fair because . . .	
"Because of something else; it's on my head; it comes from my mother."	"Because I inherited it from my parents."
A man fell down in the street because . . .	
"Of the World War."	"Because he slipped."
The sun comes up in the morning because . . .	
"Because it's a gas."	"Because the earth goes around the sun."
The wind blows because . . .	
"Just cosmic dust."	"Because of atmospheric air-currents changing."

Quite obviously in the asyndesis of schizophrenia we are dealing with a process that may become reversible and coincide roughly with the general disorganization of the patient. We have witnessed here the spontaneous disappearance of asyndesis, coincidentally with marked general improvement, in a person who had previously exhibited it rather prominently. Evidently in the development of his illness there resulted a specific type of disorganization of reasoning into that peculiar form of vagueness in which a loose clustering replaced the concept-formation of the normal adult; and then, as recovery began, the process apparently became reversed and definitive concepts reappeared. This observation points the way to another possible measure of schizophrenic disorganization and recovery. It also furnishes some evidence in support of Gruhle's assertion in the course of his criticism of Kleist, "that the total speech function complex remains potentially present in the schizophrenic" (5).

The appearance of asyndetic reasoning in such profusion has a special significance in schizophrenics. It is a characteristic far more common in normal young children than among adults: for example, in 600 examples of causal and antithetical expressions we have collected from normal adults it appears only 6 times.

Piaget has adduced an impressive array of evidence for his dominant thesis that adult logic is born of necessity, the necessity for influencing or convincing others. It is thus to a large extent the result of socialization, the outcome of social impact. Its absence in children he regards as evidence that they are still to that extent asocial, and its development he takes as a measure of their socialization. The least that can be said of the attitude of our patients is that in connection with their responses they commonly exhibited a strikingly easy satisfaction with inadequate and often unintelligible products. Some of them showed a haughty unconcern or a flat indifference. Others in better rapport obviously took it entirely for granted that they were being understood and, as we shall see in connection with metonymic distortion, their attempts at further explanation were often much less intelligible than the original response had been.

#### METONYMIC DISTORTION

*Metonymic distortion* consists of the substitution of an approximate but related term or phrase for the more precise definitive term that normal adults would presumably use in the same setting. Unlike asyndesis it has no exact counterpart in the reasoning of children; it represents indisputably a species of disorganization rather than a mere reduction to a lower level of organization. It is related to asyndesis in that it also is in part the outcome of an incapacity for selecting, restricting, and eliminating. The consequence of this is that here also the schizophrenic attributes a false equivalence to several terms or phrases which in the normal person might belong to the fringe of his conceptual structures. Instead of the precise term at the bull's eye, the patient strikes the target elsewhere toward the periphery. It is this peripheral use of approximate metonyms that lends to schizophrenic expression a great deal of its peculiar flavor of elusiveness. The products of metonymic distortion can within limits be translated into conventional logical English. This is essentially a translation of idiom,—an idiom so highly individualistic that it cannot serve effectively for social communication. To the translator it brings the same feeling of effort that attends

the translation of foreign idiom into one's own tongue. Here are some examples:

Case 16 says he is alive "because you really live physically because you have menu three times a day; that's the physical." (What else is there besides the physical?) "Then you are alive mostly to serve a work from the standpoint of methodical business."

The first sentence obviously means that on the physical side you live because you eat (*have menu*) three times a day. "*You really live physically because*" conveys the sense of "on the physical side you live because," but the actual phraseology is distinctly metonymic and until translated into a more conventional logical structure, leaves one with an uncomfortable sense of uncertainty as to the exact intention of the speaker. In the second sentence, "*to serve a work*" represents an inadequate fusion of *to serve* and *to work*, in which the normal elimination of one phrase or the other is wanting. The remainder, "*from the standpoint of methodical business*," is this patient's idiom for daily routine.

Case 7 thinks his body makes a shadow "because it hides the part of the light that is used for full room capacity or area capacity which you intervene."

The metonymic term *intervene* is almost correct, but it should be "intercept." *Full room capacity* and *area capacity* both give one the feeling of completeness and expanse; they imply the total surface from which part of the light is cut off by the intervention of your body but they don't actually say it. Here, as in many of the asyndetic forms, it is impossible to regard any of the explanation as irrelevant. One feels the reasoning is basically correct but the structure in which it appears can satisfy only the speaker; as an instrument of social communication it is almost worthless.

Case 7 says that the sun comes up in the morning "because it is the actual rotation of its axis between the arctic and the antarctic zone, the differences between the stages of its axis during different eclipses of the moon."

This is a structure built up chiefly of metonymic approximations. "*The actual rotation of its axis*" undoubtedly refers to the rotation of the earth on its axis, although earth is never mentioned by the patient. "*Between the arctic and antarctic*

"zones" is a very nice example of the substitution of wide geographical areas for the narrower and more precise north and south poles. The general sense of phases in the earth's rotation is conveyed hazily in "*the stages of its axis*"; and the "*eclipses of the moon*" are included because the patient feels vaguely that they belong to the picture. He fails to eliminate this because he is incapable of sharpening his focus and rejecting the fringe.

The same patient says a fish can live in the water "*because it's the natural resource of life*" instead of the far simpler "*because that's its nature*" which another one gives. "*Natural resource of life*" is an unprecise metonymic phrase in which "*its nature*" and "*its resources*" are inadequately blended. Case 13 thinks it can live in the water "*because having no eyes to see on land if it crawls,*" expressing in his own individual phraseology its lack of equipment for a life on land where it would have to crawl. The focus is on the wrong aspects of the situation, and the whole image is blurred to an even greater extent than in most of the preceding; but the feeling his explanation conveys in its personal idiom shows relevancy and at least some grasp of the problem.

Case 3 says his body makes a shadow "*because of my flesh, my skin,*" metonymic terms for "*body*" which convey the sense of solidity but are still only peripheral approximations. When Case 19 says her's makes a shadow "*because it's like the sun,*" she evidently means that it is *in relation* to the sun, just as another patient does when he says his body is *in contact with* the sun. Case 6 uses an habitual personal idiom for "*body*" when she says "I am good because I think it's best for any *physical flesh*."

Case 16 responds to "I am a man because . . ." with this: "Trying to find me or way of trying to get a proper vision." (What does that mean?) "Working for an assignment where I can be placed somewhere to be of service." (What 'assignment' would you like?) "The way I feel I'm not very capable."

The first sentence expresses an attitude of trying to find himself and of trying to gain adequate perspective. In the second sentence he follows the same sense through to the wish to be of some use; and he ends with a statement of quite justifiable futility. In this example the strikes are preponderantly on the

periphery of the target. Without translation into a more logical structure the whole response has very little value to this patient's hearers; yet he is quite satisfied with his product and indicates no uneasiness concerning his own intelligibility. This is the core of the problem. Since communication is the essential social function of language behavior, the ability to define and sharpen one's concepts further when one's hearer shows the need for it gives a rough indication of sociability. It depends primarily upon the capacity for putting one's self in the place of another.

It is therefore worth mentioning that disorganization seems to be favored by extension or amplification of responses. In some cases further questioning that was intended to lead the subjects to greater precision and definitiveness served only to introduce a more pronounced vagueness. The loose organization of their thinking makes the addition of fringe elements irresistible and the delimitation to simple unextended statements very difficult. After a fairly satisfactory response the person goes on needlessly to add related but less relevant terms; the result may be first a good phrase and then something that sounds like a jumble. This apparent jumble is made up of elements belonging to the periphery of the concept and undoubtedly shared in common with other loosely organized clusters or concepts. A few illustrations bring out this common phenomenon of *scatter by amplification*:

I am alive "because I was born a human *and animal life and normal life*."

A man fell down in the street "because he stumbled *or else fell*." (Did he stumble and then fall?) "I don't think he stumbled."

I took a bath "because it's purifying *to shine of body flesh*."

A boy threw a stone at me "because he had mischief and *arm exercise to exercise the body*."

I am good "because brought up right *and strictly confidential*."

I get warm when I run "because I like careless exercise." (Why do you get warm?) "Well, I think it's more the same ailment, takes terrible bites. It happens to many people."

The general attitude of these persons toward their productions is a very significant point. In the last example above, for instance, this rather amicable patient spoke in her usual quiet confidential manner, perfectly satisfied with what she was saying and in her entire manner indicating plainly that of course she was

being understood. Like Piaget's young children, these patients take it quite for granted that they are understood. They seem unable to assume their listener's point of view, and often fail to see any necessity for even trying to do so. There remain now still other and more involved instances to be discussed briefly, in which the theme of the problem keeps reappearing, while fragments relating to the dominant preoccupations interpenetrate and form at times a rather intricate pattern.

#### INTERPENETRATION

Preoccupation with personal themes may be definitely asocial but it is not in itself abnormal. Who has not at one time or another found his thinking about relatively neutral matters colored by an unrelated topic of high personal value? When, however, during waking life the intrusion of personal material functions as a disorganizing factor in reasoning, and particularly in communicated reasoning, then it becomes definitely abnormal. This is a characteristic of schizophrenic thinking that is found well-developed only in severe disorganization. In its well-developed form it consists of the interpenetration of the elements or fragments of different themes, sometimes of a theme and a counter-theme,—in our material the one concerned primarily with the immediate problem that we have introduced from the outside,—and the other deriving from persistent preoccupations of a personal nature. It is another form of the schizophrenic disorder of fusion which does not permit the normal subordination of one theme to another, or the elimination or deferring of one in favor of the other. The undigested elements of both proceed along together as coördinates, and the result is a conglomerate without synthesis.

Here is a clear example. The habitual preoccupations of this woman cannot be eliminated or deferred. They become interpenetrated by terms relating to the intruding concept of the problem we have presented: How is it that a fish can live in the water? One gets, in place of a conclusion in directive form, what turns out to be a sprinkling of vaguely related words in a dis-

organized setting. The example strikes one at first glance as mere jabber:

(A fish can live in the water because . . .) "Because it's learned to *swim*." (What if it couldn't swim?) "Not naturally, he couldn't. Why do certain gods have effects on *seas* like that? What does the *earth* have such an effect to break their backs? The *fishes* near home *come to the surface and break*." (Why?) "I think it is due to bodies that people lose. A body *becomes adapted to the air*. Think thoughts and break the *fishes*."

The personal preoccupations of this person are very bizarre. They center largely about her body and imaginary injuries to it, of which being bitten and having her back broken are prominent. The appearance in this stream of references to *certain gods, bodies, back, effect, lose, break*, result from the material of her usual personal themes with which her medical attendants are quite familiar. The terms and phrases italicized in the example above belong to the intruding problem and these are sprinkled throughout the stream to the very end. Both lines of thought are evident in these traces. If one thinks very loosely of fish in water and what happens to them on land it will be appreciated that much of this material is vaguely relevant. "*Why does the earth have such an effect to break their backs?*" represents an inadequate fusion of what happens to fish thrown out of water, with the patient's own concern over her supposed broken back. A similar fusion appears in, "*The fishes near home come to the surface and break*," where the previous vein manages to distort "breathe," which was probably intended. Later on, in the last phrase of all, "*break the fishes*," the two themes are juxtaposed. In "*a body becomes adapted to the air*" the problem has become displaced instead to a corollary of the aquatic adaptation of fishes, very likely as a result of her recurrently shifting focus to vague concern over her own body.

Another example, taken this time from our most hostile patient, will be briefly analyzed. His emotional reaction is, in fact, not at all inconsistent with the general content, but the disorganization is marked. This is interesting in view of Stransky's emphasis upon the rôle played by inadequate feeling-tone upon the production of disorganization, for which he uses the analogical term "intrapsychic ataxia" (23). This patient's domi-

nant theme is that he is God, never stated very definitely or explicitly but given quite unmistakably by implication. He is always at war with the devil, he always remarks on the key to the outside, and he reacts with definite resentment to any change in personnel or routine on the ward. Here is his statement, given slowly, forcibly, and with strong emphases.

(I get warm when I run because . . .) "Because you possessing a position of a doctor have the key. The devil *seeing you run* becomes ired. God doesn't get ired because it doesn't have any effect. He doesn't want a *railroad* or an *express company* in this place."

The influence of the problem is evident in the italicized words. The running is ascribed to me. It is the devil who "becomes ired" at my running and not God (*i.e.*, the patient) who is superior to such things and therefore unaffected by them. His own genuine annoyance at my being in the place and questioning him slips out at the end in an interestingly distorted form in which he very pointedly and emphatically states that God doesn't want this running-person (*railroad, express company*) around the place. By way of further example of his attitude, this patient at a later date ordered a small group of my students out of a corridor, where they were quietly going over their notes, on the grounds that God didn't want "a reading class" in the place.

Finally a third example will be given this time from the solutions offered by a young man with unrealized ambitions to be an engineer. He met each of the problems in this study with modesty and close attention, couching his explanations in pseudo-scientific terms from which it was obvious that he was deriving a quiet satisfaction. There is a strong metonymic component throughout. This is a sample:

(My hair is brown because . . .) "Because it is a sort of hydraulic evering." (What does that mean?) "It means that it gives you some sort of a *color-blindness* because it works through the *roots of the hair* and hydrasee,—that is a study of the *growth of plants*, a sort of *human barometer*, hydraulic hydroscopic method."

The persistent personal theme in this young man takes the form of what he regards as engineering. His lack of a sufficient supply of technical terms in the face of his scientific pose is responsible for the neologisms *evering*, *hydrasee*, *hydroscopic*;

these and the term *hydraulic* form the thread of the distorting personal theme. The terms italicized in the example relate to the intruding problem. The color of the hair is related correctly to the roots and to growth. But color extends to *color-blindness* and the growth cannot be restricted to the narrower concept in question but must go on to *growth of plants* and the *human barometer*, the latter representing inadequate fusion of the problem-theme and the pseudo-scientific theme.

These are examples of a type of distortion of reasoning through interpenetration, in which personal preoccupations form a theme that competes seriously with the problem-theme for the stage. It gives one the impression of even greater irresistibility than in the vague but not entirely abnormal asyndesis and in the unclear groping of metonymic thought. The world of fantasy here forms more nearly a coördinate system and maintains an influence that is more continuous over the stream of talk initiated by this presentation of a problem in reasoning. Interpenetration occurs chiefly in severe degrees of disorganization where, however, there is still preserved some remnant of the capacity for limiting one's self to a topic imposed arbitrarily from without. When this capacity becomes negligible or disappears little or nothing remains of reasoning in its social forms. Of this phase we have specimens also, but they fall outside the scope of this study.

#### SUMMARY AND DISCUSSION

The prime significance of symbolization has been especially stressed by Adolf Meyer as "the fundamental and specific feature of psychobiological integration" which brings on the same level "reference to reality and fancy, past, present and future, personal and social, as if it were all present" here and now in a single individual. It is "the characteristic psychobiological . . . activity that we call mentation" (12). In our study we have focussed attention upon disturbances in the functional use of symbolization, as they appear in schizophrenic disorganization, and have compared our results with the data of genetic psychology.

The reasoning of the child has been shown to follow a certain general order as he progresses toward maturity. Quite early he develops an ability to handle causal relationships. This can be demonstrated by the way he makes use of the organizing function of *because* in binding together dynamically related terms. At first he shows a very marked preference for ascribing motivation as his leading causal principle; only later on does he give an adequate place to the relationship of cause-and-effect. From such facts as these it has been concluded that the latter represents a definitely more mature phase of reasoning, and that the genetic development of reasoning may in part be followed by observing the waning emphasis upon motivation and the growth of the use of cause-and-effect. Still later in development is the notion of discordance, and so this serves as another milestone in the reasoning of the child.

It is self-evident that such data suggests a clue to the study of schizophrenic disorganization, which has been looked upon by some as a process of regression retracing in a reverse direction the path of development that runs from infancy to maturity. If this be a true picture of regression, one may expect the process of disorganization to result in the successive reappearance of genetically earlier forms of reasoning, roughly in the reverse order of development, as successive "layers" were peeled off. This does not apparently take place. Instead, the disorganization that we find proceeds as a whole, and results in something quite unlike the reasoning of children. Evidently regression does not simply retrace the path of development but follows instead a pattern of its own.

In the first place, it is motivation as a causal principle that suffers most in the schizophrenic disintegration of reasoning, in spite of its being genetically least mature; while cause-and-effect is relatively well preserved. Moreover, within the schizophrenic group, as one passes from those with mild to those with severe disorganization one still finds no decrease in the relative utilization of the cause-and-effect relationship. Finally, in comparing the whole group of causal relationships with the still more mature discordance we find still further corroboration; with increased

severity of disorganization there is a progressive loss in effectiveness, not of discordance, but again of the less mature causal relationships. In short we are witnessing something that is not simply a return to the infantile, but is the functional disintegration of a remarkable, mature organization which is the result, as Meyer says, of "that tremendous development which has as its essence the use of symbols" (11). The functional disintegration of such an organization yields products which, far from duplicating those of puerile reasoning, remain in many respects quite unique and together account for the more or less specific character of schizophrenic thinking disorders.

The asyndetic clusters that, among schizophrenics, tend to replace synthetic concepts are not altogether foreign to children's reasoning. Their outstanding characteristic is that of a paucity of functional connecting links which if present would bind together some of the elements that are evidently "felt" to belong together. Indeed, they usually are related to the problem and to each other; they are not simply random terms, but represent unorganized relatedness,—a collection of fragments that cannot be welded into a whole. Indeed, when the attempt was made by subjects to give a further explanation, less instead of greater definition usually resulted with the amplification; and it is possible also in Hadlich's study of the schizophrenic interpretation of proverbs (6) to detect in the verbatim material he quotes a similar phenomenon. A synthetic whole of this sort can become organized only through selection and elimination. Just as soon as functional connecting links are introduced it follows that one element will be retained and others will have to be excluded; but this selection and elimination is just what the schizophrenic is often unable to do.

Schizophrenic thinking tends to stick to everything it touches. Its loose structure permits the presence at the same time of potentially contradictory elements. This is possible simply because the actual contradiction which would arise in the process of the functional organization of concept-formation does not come to pass. A false equilibrium results which then no longer requires the elimination of one term simply because it is not brought explicitly

into relation with its opponent. The result is incongruity and ambivalence. That asyndetic thinking is part of the schizophrenic process is evident from its appearance in one of our cases at the height of the illness and its spontaneous disappearance with partial recovery. This points the way to another measure of disorganization and recovery; and it deserves further emphasis because in the asyndetic form of reasoning one may recognize evidences of that mild language disorganization which often heralds an early schizophrenic development.

Kraepelin, in his discussion of dementia praecox (9), has described the misuse of terms from a somewhat different point of view, using the concept of *derailment* (*Entgleisung*). Under this conception he includes such disturbances as changes in pitch, rate, rhythm, loudness and timbre of spoken words, the introduction of sniffing, snorting, smacking the lips, etc., and the use of affectations and tiresome repetitions. He includes as well what he regards as forms of paraphasia and of paralogia. The paraphasic forms include simple mutilations, alterations, or partial fusions of commonly used words, and the formation of unintelligible words from constituent syllables which, however, have sense; and neologisms he regards as a further form of the same thing in which even the syllables are senseless. He describes displacement paralogia in which the patient, unable to find the expression appropriate to his thought, produces something having a similar sound, and derailment paralogia in which the patient lets his thoughts fall into quite another channel. According to Kraepelin the patient "deliberately avoids the right answer which he certainly has at his command." Finally, under derailment of the train of thought, there is described the derivation of one series of ideas from another nearby, as when the patient answers the question, "What is the year?" by saying, "It might be Australia," substituting for a series of years the series of continents. Kraepelin feels that where "a negativistic evasion of the right answer is not clear" one can assume that the form is derived from a "talking past the subject," in which the ideas have been pushed aside or suppressed by remote or opposing ones.

This explanation of Kraepelin's is based upon the older psychological conception of thought as a concatenation of more or less separate associative units, and the examples are largely derived from isolated samples of the stream of talk. Bleuler (2) developed the hypothesis that associations formed through experience were held in their tracks by "a dynamic something,"—*die Assoziationsspannung*,—which was diminished in sleep and distraction, and that probably its weakness was basic for the specific schizophrenic phenomena, "because from these anomalies almost all the known schizophrenic symptoms can be derived." In the fifth edition of his textbook (3), however, the discussion of schizophrenic disorders of association has omitted reference to this hypothesis.

"Reasoning," Pillsbury says, "like any other mental operation, can be understood only in its setting" (17). We feel that by our method of restricting the setting in giving the subjects a pre-determined problem, by taking account at the same time of their attitude and their intent, a more fruitful conception may evolve that brings out in these phenomena rather a functional significance, and relates them to the development of communication as a social product.

Naturally, the lack of definitive organization in children, as in schizophrenics, means impairment in communication. It has been abundantly shown that the development of adult logical form is the product of necessity and develops with the increase in the child's socialization. The young child characteristically takes it for granted that he understands and is understood. He is at first quite unable to put himself in another's position and see things from another's perspective. He does not mould his individualistic thought into conventional logical form before presenting it to his hearers; he "sees" or "feels" the relationship and that is evidently all that he needs to satisfy himself of its effectiveness. It is only after repeated conflicts and failures to get coöperation with others that he discovers the necessity for adhering to certain social conventions of expression for the communication of attitudes and information. The child's efforts at communication are deficient because he has not yet achieved effective

social contact with others. The schizophrenic has given it up. Minkowski (13) makes the acute observation that "The blind, the mutilated, the paralyzed are able to live in just as close contact with their surroundings as individuals whose sight is intact and who have their four limbs; the schizophrenics, on the other hand, lose this contact without any alteration in their sensorimotor apparatus, their memory or even their intelligence."

In metonymic distortion the divergence from the normal is already very marked. In place of a correct term, the schizophrenic patient offers a poor approximation, usually without becoming in the least disturbed if his listener is unable to grasp his meaning. Like the child he may be quite unable to place himself in the place of his hearer; and usually he recognizes no need to do so. He shares with the child an easy satisfaction with totally inadequate verbal productions, which he may then proceed to amend with a statement which often conveys to the hearer less than the original exposition. But these metonymic forms, in our material, with rare exceptions, satisfied the patients completely; it was the experimenter who was confused and not the subject. Some of them were considerate enough to elaborate here and there, adding incidentally to the uncleanness; others did not conceal their contempt or anger at the experimenter's inadequate grasp. Reasoning expressed in this way and with this attitude can fairly be termed asocial in proportion as it becomes relatively uncommunicable. Unlike most aphasics, with whom C. Schneider (19) has contrasted them, these patients make no spontaneous compensatory efforts to bridge the gap between you and them left by their inadequate use of language. The common occurrence of metonymic distortion throws further light upon the problem of regression. It, too, represents a product of a true disintegration rather than a delamination, and it is not comparable to puerile forms.

There seems to be even less concern over the other person's understanding in metonymic distortion than in asyndesis. The equivalence of related terms may so be taken for granted that the patient's statements fairly bristle with approximations and yet cause him no apparent uneasiness. Finally, in what we have

called interpenetration, reasoning has reached a stage where new material may enter only if it submit to being broken up and given a place here and there in the more compelling stream of asocial preoccupation. Asocial fantasy has at last become sufficiently dominant to resist subordination to an intruding problem and succeeds in fragmenting it, while partially assimilating it to the prevailing system of preoccupation. The real can no longer displace the fanciful; everything introduced must be related to whatever is present. Objectivation becomes lost and each thing must be explained by such a process of assimilating it to the all-absorbing dream-life in force at the time. In this way external problems, subjected to the criteria of imagination, come out like a dream. From the standpoint of social communication and its disorganization in the schizophrenic, it can be said that in *asyndesis* the patient finds it inconvenient to put himself in another's place; in *metonymic thinking* he does not feel that it is necessary; and in *interpenetration* he is no longer able to effect it.

#### LITERATURE CITED

1. ABEL, T. Unsynthetic modes of thinking among adults: A discussion of Piaget's concepts. *Amer. J. Psychol.*, 1932, **44**, 123-132.
2. BLEULER, E. Störungen der Assoziationsspannung ein Elementarsymptom der Schizophrenien: Eine Hypothese. *Allg. Zsch. f. Psychiat.*, 1918, **74**, 1-21.
3. —— *Lehrbuch der Psychiatrie*. 5th Ed. Berlin, 1930, 50-53.
4. DOMARUS, E. von. Das Denken und seine krankhaften Störungen. *Würzb. Abh. aus d. gesamtgeb. d. Medizin*, 1929, New Series, **5**, 369-456.
5. GRUHLE, H. In O. Bumke's *Handbuch der Geisteskrankheiten*. Spezieller Teil V: Die Schizophrenie. Berlin, 1932, 135-210.
6. HADLICH, H. Schizophrene Denkstörung. *Psychol. Forsch.*, 1931, **15**, 359-373.
7. HAZLITT, V. Children's thinking. *Brit. J. Psychol.*: General Section, 1930, **20**, 354-361.
8. HUANG, I. Children's explanations of strange phenomena. *Psychol. Forsch.*, 1931, **14**, 63-182.
9. KRAEPELIN, E. *Dementia Praecox and Paraphrenia*. [Tr. by R. M. Barclay from the 8th German ed. of *Lehrbuch der Psychiatrie*.] Edinburgh, 1919.
10. LUQUET, G.-H. *Les Dessins d'un Enfant*. Paris, 1913.
11. MEYER, A. Interrelations of the domain of neuropsychiatry. *Arch. Neurol. & Psychiat.*, 1922, **8**, 111-121.
12. —— The Fourteenth Maudsley Lecture: British influences in psychiatry and mental hygiene. *J. Ment. Sci.*, 1933, **79**, 435-463.
13. MINKOWSKI, E. *La schizophrénie: Psychopathologie des Schizoïdes et des Schizophrènes*. Paris, 1927, 82-83.

14. PIAGET, J. La pensée symbolique et la pensée de l'enfant. *Arch. de Psychol.*, 1923, **18**, 273-304.
15. ——— *Judgment and Reasoning in the Child*. New York, 1928.
16. ——— *The Language and Thought of the Child*. New York, 1932.
17. PILLSBURY, W. *The Psychology of Reasoning*. New York, 1910.
18. REISS, E. Zur Theorie der schizophrenen Denkstörung (Abstract). *Zentbl. f. d. ges. Neurol. u. Psychiat.*, 1921, **25**, 432-434.
19. SCHNEIDER, C. Über die Unterscheide zwischen schizophrener Sprache und Aphasie. *Zsch. f. d. ges. Neurol. u. Psychiat.*, 1925, **96**, 251-274.
20. ——— Beiträge zur Lehre von der Schizophrenie: Über die allgemeine Theorie der Schizophrenen Symptome. *Zsch. f. d. ges. Neur. u. Psychiat.*, 1925, **96**, 572-602.
21. SINGER, H. D. Is dementia praecox properly described as an infantile mode of reaction? *J. Abn. Psychol.*, 1917, **11**, 305-308.
22. STORCH, A. The primitive archaic forms of inner experiences and thought in schizophrenia. *Nerv. & Ment. Dis. Monog.*, 1924, No. 36.
23. STRANSKY, E. Zur Kenntnis gewisser erworbener Blödsinnsformen: Zugleich ein Beitrag zur Lehre von der Dementia praecox. *Jahrb. f. Psychiat. u. Neurol.*, 1903, **24**, 1-149.
24. SULLIVAN, H. Peculiarity of thought in schizophrenia. *Amer. J. Psychiat.*, 1925-26, **5**, 21-86.
25. VIGOTSKY, L. S. Thought in schizophrenia (trans. by J. Kasanin). *Arch. Neur. & Psychiat.*, 1934, **31**, 1063-1077.
26. WHITE, W. The language of schizophrenia. In *Schizophrenia (Dementia praecox): An investigation of the most recent advances, as reported by the Association for Research in Nervous and Mental Disease*. New York, 1928, 23-43.
27. WILDERMUTH, H. Schizophrene Zeichen beim gesunden Kind. *Zsch. f. d. ges. Neurol. u. Psychiat.*, 1923, **86**, 166-173.

